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ORIGINAL ARTICLE

Improved self-management ability and well-being in older women after a short group intervention

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Abstract

In the present randomized controlled trial (RCT) it was investigated whether single women, 55 years of age and older, improved with regard to self-management ability, well-being, and social and emotional loneliness after having participated in a newly designed self-management group intervention based on the Self-Management of Well-being (SMW) theory. The expected mediating effect of self-management ability on well-being was not found. Although self-management ability, well-being and loneliness improved significantly in the intervention group immediately after the intervention, and also remained at this improved level after six months, there was also improvement in the control group after six months, rendering the longer-term differences between the groups non-significant. It can, however, be concluded that, although the longer-term effectiveness could not be proven, this SMW theory-based intervention seems to be useful in supporting older women to improve their self-management ability and well-being.

Introduction

Since modern Western societies now provide us with very good medical and social facilities, the life-expectancy of older people is increasing. At the same time, more older people, and especially women, are living alone. Additionally, sociological changes, such as the individualization of society, changes in social networks, and changes in health care systems are forcing older people, and especially women, to rely more on their own resources (Lewis, 2003). This means that self-management abilities are becoming more important. Until now, self-management interventions for older people have focused primarily on changes in the life-style behaviour of people with chronic conditions (Ersek, Turner, McCurry, Gibbons, & Miller Kraybill, 2003; Lorig & Holman, 2003; Van Eijken, Wensing, & De Konink, 2004). Fewer self-management intervention studies have focused on reducing social isolation, or promoting well-being.

One of the main factors that contribute to social isolation is loss (in many forms). Because loss is often considered to be beyond a person's control, it is argued that it is very difficult to design successful

interventions to counter social isolation. Stevens and Van Tilburg (2000) evaluated a friendship course to promote well-being and to alleviate loneliness in older women. They found a reduction in loneliness not only among the women who participated in the course, but also in the matched control group. In a recent review of the empirical literature on the effectiveness of interventions to reduce social isolation, Findlay (2003) concluded that, although numerous interventions have been implemented world wide, there is very little evidence showing that they work (see also Andersson, 1998). Moreover, the existing evaluations of effectiveness are often flawed by weak methodologies, and only a few have been performed in randomized controlled trials (RCTs).

The aim of the present study was to design a short group intervention for single women, 55 years of age and older, and to evaluate its effectiveness in an RCT. The aim of the intervention was to increase well-being by improving self-management abilities, and thus reducing social and emotional loneliness. Social loneliness is characterized by a lack of social

integration and embeddedness (Weiss, 1973), and emotional loneliness relates to the absence of a reliable attachment figure, such as a partner (Van Baarsen, Snijders, Smit, & Van Duijn, 2001).

How does the proposed intervention differ from others? First of all, it is based on a theoretical framework, whereas most interventions lack such a basis. This framework is the Self-Management of Well-being (SMW) theory (Steverink, Lindenberg, & Slaets, 2005), which elaborates on the theory of Social Production Functions (SPF) (Lindenberg, 1996; Lindenberg, 2001; Ormel, Lindenberg, Steverink, & Verbrugge, 1999; Steverink & Lindenberg, 2006; Steverink, Lindenberg, & Ormel, 1998). The central assumption of the SPF theory is that each individual strives to improve overall subjective well-being by realizing physical and social well-being, and that this is accomplished by satisfying five basic human needs also known as the basic dimensions of well-being: comfort and stimulation (for physical well-being), and affection, behavioural confirmation, and status (for social well-being). Comfort refers to the satisfaction of basic physical needs, such as food, drink, rest, and the absence of pain. Stimulation refers to challenging and interesting events, and the absence of boredom. Affection is the feeling that others care and one cares for oneself. Behavioural confirmation is the feeling of doing the right thing in the eyes of others and in one's own eyes. Finally, status refers to the feeling of being better than others in the eyes of others and in one's own eyes (see also Steverink & Lindenberg, 2006).

The SMW theory elaborates on the SPF theory by specifying a set of six core self-management abilities which enable people to achieve and maintain the resources that are needed to satisfy the five basic needs (i.e., dimensions) of well-being. Take, for example, the need for affection, which may be satisfied by having friends (as possible sources of affection). According to the SMW theory, the following six self-management abilities are important. Prerequisites in achieving and maintaining friends are the ability to take initiatives in making friends, and the ability to be self-efficacious with regard to one's own behaviour in making friends and being a friend. The maintenance of a friendship furthermore requires the ability to invest in the friendship, which again requires the ability to have a positive frame of mind with regard to this friendship in the future (necessary for investment behaviour). Moreover, there are two additional self-management abilities that help to maximize the achievement and maintenance of friendship. The first is the ability to find and maintain multifunctionality in a friendship: a multifunctional friend is a person who can satisfy one's need for affection, but at the same time, for example, supports the fulfilment of other needs, such as the need for stimulation (e.g., participating in interesting activities or sports). The underlying

assumption is that multifunctionality in friendship yields more overall well-being than unifunctionality. The final self-management ability is the ability to take care of variety with regard to friendship: taking care of variety simply means making sure of more than one friend. 'Variety' will make one less vulnerable for potential loss in the future, and is therefore an important self-management ability in the process of aging.

Therefore, according to this theory, there are at least six self-management abilities that are important for the optimal management of important needs and resources during the process of aging (for details see Steverink et al., 2005). Moreover, each of the abilities is important in itself, but together they also accumulate to produce higher levels of overall self-management ability. Therefore, the abilities are addressed separately, but also as a composite. Previous intervention studies (RCTs) based on the SMW theory have shown positive results: Frieswijk, Steverink, Buunk and Slaets (2006) evaluated a bibliotherapy for frail older persons and found a significant increase in self-management ability and well-being in the intervention group, compared to the controls. Similar results were reported in the evaluation of an individualized self-management intervention among older hospital patients (Schuurmans, 2004). So far, however, no group intervention based on this theory has been evaluated.

The second difference between the intervention evaluated in the present study and most other interventions is that in the present study the framework that was used for designing the intervention was also explicitly applied to the evaluation of the effectiveness of the intervention. As Cattani and White (cited in Findlay, 2003) argued, one of the criteria for effective interventions is that the evaluation fits the intervention and includes a process evaluation. For the present study this means, first of all, that the six self-management abilities that were addressed in the intervention were also measured explicitly. Secondly, it means that their hypothesized mediating function in increasing well-being was evaluated explicitly (*cf.* Frieswijk et al., 2006; Schuurmans, 2004).

Based on these considerations, a short theory-based group intervention was designed and evaluated in an RCT. It was expected that the women who completed the intervention would improve their self-management abilities and that, consequently their well-being would improve compared to the women who had been randomly assigned to a control condition. A decrease in social and emotional loneliness was also expected for the women in the intervention group. Moreover, in order to investigate the extent to which such a short intervention (only six sessions) could have longer-term effects, the effectiveness of the intervention was evaluated again after six months.

Methods

Sample and study design

Potential participants were recruited in 2004 through advertisements in local newspapers in two regions of the Netherlands. Single community-dwelling women, 55 years of age and older, were asked to respond by phone if they missed having people around them, wished to have more friends, participated in very few leisure activities, or had trouble in initiating activities. Eligible women received a booklet containing information about the study and the course 'Giving life more LUSTER', together with an application form. After having applied, 142 women completed the pre-test (T_0) questionnaire, after which they were randomly assigned to either the intervention group ($n=63$) or the control group ($n=79$). The first post-test questionnaire (T_1 , after about six weeks, when the course ended) was completed by 119 women, and the second post-test questionnaire (T_2 , after about six months) was completed by 98 women.

Intervention

The course was supervised by two female leaders and consisted of six meetings, each lasting 2½ hours. The women met in groups of 8–12, for six consecutive weeks. Guided by the SMW theory, each meeting focused on one or more of the six self-management abilities. The women were taught to apply these abilities to the five basic needs (dimensions) of well-being, which were referred to with the acronym GLANS, which is Dutch for 'luster' (G for Gemak [Comfort], L for Leuke bezigheden [Stimulation], A for Affectie [Affection], N for Netwerk [Behavioral confirmation], and S for Sterke punten [Status]). During the first meeting the 'GLANS-plate with five slices' was introduced. This is comparable to the food plate with five slices that is used in the Netherlands to stimulate healthy eating habits. The women were then asked to consider their own GLANS-plate and to 'self-diagnose' their own situation: which aspects of the plate they missed, or would like to change or to work on. During the second and subsequent meetings the women learned how to work with their own GLANS-plate by adding activities and people to the slices. In the third meeting the women learned how to set goals for themselves (improving their ability to take initiatives) and how to make these goals realistic, taking small steps in order to be successful in achieving these goals (i.e., be self-efficacious). Making combinations between the slices (i.e., taking care of multifunctionality) was the theme of the fourth meeting, and in the fifth meeting it was stressed that it is very important to have reserves in each of the slices (i.e., taking care of variety) in order to have some activities or people to fall back upon when losses occur, in health, persons or activities.

The sixth and last meeting focused on how to maintain what has been achieved (i.e., investment). Throughout the course a lot of attention was paid to positive thinking (i.e., a positive frame of mind), by challenging negative thoughts and replacing them with positive thoughts. At the end of each meeting the women were given homework for the next meeting and a short summary of the meeting was handed out. The paperwork could be kept in a ring-binder which the women had been given during the first meeting.

Measures

Self-management abilities. Self-management abilities were measured with the Self-Management Ability Scale (SMAS-30, Schuurmans et al., 2005). This scale consists of 30 items and six sub-scales, each referring to one of the six self-management abilities: taking initiatives, self-efficacy, investment behaviour, positive frame of mind, multifunctionality and variety (cf. SMW theory). Examples of items are: 'Are you able to let others know that you care about them?' (self-efficacy); 'The activities I enjoy, I do together with others' (multifunctionality); 'Do you have different ways to relax when necessary?' (variety). Some sub-scales are scored on a five-point Likert scale, and others on a six-point scale. All scores were transformed to a 100-point scale. The internal consistency of the overall scale was 0.91. The scale has been tested in several studies and has been found to have good psychometric properties (Schuurmans et al., 2005).

Well-being. The Social Production Function Index Level Scale (SPF-IL, Nieboer, Lindenberg, Boomsma, & Van Bruggen, 2005) was used to assess well-being and its five dimensions. This scale consists of 15 items ($\alpha=0.79$), with five sub-scales: comfort, stimulation, affection, behavioural confirmation, and status, each containing three items. Examples are: 'Are your activities challenging to you?' (stimulation); 'Do you feel useful to others?' (behavioural confirmation); 'Are you known for the things you have accomplished?' (status). All sub-scales are scored on a four-point Likert scale. The scale has been extensively tested and has been found to have good psychometric properties (Nieboer et al., 2005).

Loneliness. Loneliness was measured according to the scale developed by De Jong Gierveld and Kamphuis (1985), which is an 11-item questionnaire with five positive and six negative items. The positive items assess a sense of belonging and the absence of a discrepancy in the area of desired relationships (social loneliness), for example, 'I can rely on my friends whenever I need them'. The negative items measure emotional loneliness, for example, 'I miss having a really close friend'. There are five answering

categories: 'yes!', 'yes', 'more or less', 'no', and 'no!'. Scores were dichotomized according to the procedure suggested by the authors of the scale, so that the scores ranged from 0 (not lonely) to 11 (extremely lonely). The internal consistency of the overall scale was 0.83. In the present study the entire scale was analyzed, as well as the two sub-scales of social and emotional loneliness. The scale is widely used and has been found to be a reliable and valid instrument (Van Tilburg & De Leeuw, 1991).

Other variables. Marital status, children, and physical functioning were also investigated to find out whether the groups differed on these measures. Level of physical functioning was measured with the six-item Physical Functioning sub-scale of the MOS Short Form General Health Survey (Kempen, Brilman, Heyink, & Ormel, 1995; Stewart, Hays, & Ware, 1988). The total score was transformed to a range from 0–100, a high score indicating better physical functioning. The internal consistency of the scale was 0.74. The scale meets the traditional psychometric criteria for validity and reliability (Stewart et al., 1988).

Results

Participants

The pre-test (T_0) questionnaire was completed by 142 women, after which 63 women were randomly assigned to the intervention group and 79 to the control group. The first post-test (T_1) questionnaire, at about six weeks after T_0 (i.e., immediately after the end of the course), was completed by 46 women in the intervention group and 73 in the control group, and the second post-test (T_2) questionnaire, at about six months after T_0 , was completed by 36 women in the intervention group and 62 controls. A total of 13 women dropped out before the end of the intervention. The reasons for drop-out were diverse. Some women felt that the intervention was too much of a mental or physical burden; some felt that they did not fit in with the group; and others felt that they did not learn anything new from the intervention. Four other women did not even attend the first meeting. When they were phoned by the

researcher they were either ill, had doubts about participation or were unable to schedule the intervention in their agenda. Another group of drop-outs consisted of women who did not return the first post-test (T_1) questionnaire (0 intervention, 6 controls) or the second post-test (T_2) questionnaire (10 intervention, 11 controls). The unequal drop-out rates could have affected the reliability of the statistical analysis. We therefore tested the equality of variances. All values were non-significant, indicating that the unequal group-sizes were no problem.

Table I shows that there was no significant difference between the baseline characteristics of the 46 women who completed the intervention, and also completed the T_1 questionnaire, and the baseline characteristics of the 73 women in the control group who were still participating at T_1 . Although the controls tended to be somewhat older than the women in the intervention group, this difference was not significant, $t(1, 117) = 1.75$, $p = 0.06$. In addition, no significant differences were found with regard to marital status, $\chi^2 = 5.08$, $p = 0.17$, children (children or no children), $\chi^2 = 2.92$, $p = 0.09$, or level of physical functioning, $t(1, 116) = -1.00$, $p = 0.32$.

Analyses of variance also showed no significant differences in the scores for the SMAS-30, the SPFI-IL, or the loneliness questionnaire at T_0 between the 98 women who completed all three questionnaires and the 44 women who dropped out, suggesting that there was no selection bias with respect to these measures. Although the drop-outs seemed to score somewhat lower ($M = 42.3$) on the SMAS-30, $F(1, 137) = 3.72$, $p = 0.06$ than those who completed all questionnaires ($M = 46.6$), this difference was not significant.

Subjective evaluation of the intervention

The women who completed the intervention were asked to answer a few evaluative questions immediately after the final meeting. Approximately 77% indicated that they had enjoyed the intervention, and approximately 84% felt that the intervention was worthwhile. More than half of the women reported that the intervention had met their expectations.

Table I. Baseline characteristics of women who completed the intervention and controls who were still participating in the study at T_1 .

	Women who completed the intervention ($n = 46$)	Women in the control group ($n = 73$)
Mean age	62.8 (SD 6.4)	65.2 (SD 7.6)
Marital status	Never married: 10 (21.7%) Divorced: 24 (52.2%) Widowed: 12 (26.1%)	Never married: 10 (14.5%) Divorced: 29 (42.0%) Widowed: 30 (43.5%)
Children	No children: 13 (28.3%)	No children: 11 (15.3%)
Physical functioning	58.5 (SD 25.0)	53.2 (SD 29.2)

Minor discrepancies in column totals are due to missing values.

Some felt that six meetings were not enough, whereas others felt that the number of meetings was sufficient. They were also asked to evaluate the intervention on a 10-point scale (0 = very bad to 10 = very good). The mean score was 7.9. Six months after the intervention all women (also the controls) were asked to indicate whether they felt that their lives had more 'luster', compared to six months ago (before the intervention), whether they participated in more activities, whether they had more social contacts, and whether they felt that their general health status had improved. However, at that point there was no difference between the answers given by the women who had completed the intervention and the answers given by the controls.

The effect of the intervention: self-management ability

Mean sum-scores on the SMAS-30 (overall score and the six sub-scales), the SPF-IL, and the loneliness scale (with two sub-scales) at T_0 and at the two post-tests (T_1 and T_2) are shown in Table II. No significant differences in these measurements were found at T_0 between the intervention group and the control group, indicating that the randomization procedure was successful.

In order to compare scores for self-management abilities between the groups after the intervention, univariate analysis of covariance (ANCOVA) was performed, with SMAS-30 scores at T_1 as the dependent variable, group as the independent variable, and SMAS-30 scores at T_0 and marital status as covariates. Marital status was included as a covariate because the number of widows in the groups differed (although not significant: 26.1% versus 43.5%), and because this variable might be associated with the outcome variables. As can be seen in Table II, there was a significant effect of group on SMAS-30 scores at T_1 , $F(1, 108) = 5.61$, $p < 0.05$, indicating that the intervention group increased significantly in overall self-management

ability after the intervention (at T_1), compared to the controls. With regard to the longer-term effects, it was found that, although the intervention group scored even higher on the SMAS-30 after six months (at T_2), the controls also had higher scores, rendering the difference between the two groups non-significant at T_2 , $F(1, 88) = 2.74$, $p = 0.10$.

To investigate whether all or only some of the six self-management abilities improved after the intervention, several ANCOVAs were performed. A significant effect of group was found for the sub-scales 'taking initiatives' $F(1, 115) = 5.93$, $p < 0.05$, 'positive frame of mind' $F(1, 116) = 15.77$, $p < 0.001$, and 'multifunctionality' $F(1, 114) = 4.82$, $p < 0.05$, indicating that the intervention was effective for these self-management abilities. However, no group effects were found for the sub-scales 'self-efficacy' $F(1, 114) = 1.08$, $p = 0.30$, 'investment behaviour' $F(1, 115) = 2.67$, $p = 0.11$, and 'variety' $F(1, 112) = 0.07$, $p = 0.80$, indicating that the intervention had no effect on these abilities. When analyzing the differences between the groups at T_2 , as compared to T_0 , no significant group effects were found.

It can be concluded that the intervention was successful in the short-term in increasing overall self-management ability, and specifically the separate abilities of taking initiatives, a positive frame of mind, and taking care of multifunctionality. However, although the intervention group scored higher on all self-management abilities at T_2 compared to T_0 , the controls in general also had higher scores at T_2 compared to T_0 rendering all differences between the two groups non-significant in the longer-term.

The effect of the intervention: Well-being

Hierarchical regression analyses were performed to study the direct effect of the intervention on

Table II. Means and standard deviations (in parentheses) for self-management abilities, well-being and loneliness reported by women who completed the intervention and controls.

	T_0		T_1		T_2	
	E <i>n</i> = 63	C <i>n</i> = 79	E <i>n</i> = 46	C <i>n</i> = 73	E <i>n</i> = 36	C <i>n</i> = 62
SMAS-30	44.7 (9.6)	47.4 (7.3)	48.6 (8.1)	47.5 (8.6)	49.6 (6.9)	49.0 (9.7)
Taking initiatives	54.3 (14.3)	57.4 (11.7)	57.7 (13.6)	55.2 (12.0)	57.6 (9.9)	58.0 (13.3)
Self-efficacy	52.5 (12.5)	55.6 (11.7)	55.6 (12.3)	56.3 (12.9)	58.5 (9.7)	59.5 (14.2)
Investment	57.0 (15.3)	62.3 (12.9)	59.2 (15.4)	59.9 (11.9)	64.0 (15.7)	63.5 (12.9)
Pos. frame of mind	56.2 (15.1)	58.6 (13.5)	63.6 (10.7)	58.6 (13.0)	62.9 (11.5)	60.5 (15.0)
Multifunctionality	32.7 (13.3)	37.4 (11.6)	36.1 (14.6)	36.2 (12.6)	35.2 (13.9)	37.1 (12.9)
Variety	47.5 (17.3)	50.4 (12.6)	54.0 (14.6)	55.3 (15.9)	51.2 (14.1)	52.1 (12.6)
SPF-IL	6.4 (4.0)	7.1 (4.0)	7.8 (4.2)	6.7 (4.2)	7.8 (4.4)	7.8 (4.4)
Loneliness	8.4 (2.9)	7.4 (3.3)	7.4 (3.3)	7.0 (3.5)	6.4 (3.5)	6.7 (3.6)
Emotional loneliness	4.9 (1.6)	4.3 (1.9)	4.3 (1.9)	4.0 (2.0)	4.1 (1.9)	4.1 (2.0)
Social loneliness	3.4 (1.7)	3.1 (1.8)	2.8 (1.9)	3.0 (1.9)	2.9 (1.9)	3.1 (1.8)

E, women who completed the intervention; C, controls; SMAS-30, Self-Management Ability Scale; SPF-IL, Social Production Function Index Level Scale.

Table III. Summary of hierarchical regression analysis for variables predicting well-being at T₁.

Variable	SPF-IL T ₁			
	ΔR^2	<i>B</i>	SE <i>B</i>	β
Step 1	0.43**			
SPF-IL T ₀		0.62	0.08	0.58**
Step 2	0.04*			
Condition		1.58	0.57	0.19*
Step 3	0.08**			
SMAS-30 T ₁		0.15	0.03	0.30**
Full model		Adj. $R^2 = 0.54$, $F(3, 100) = 41.35^{**}$		

Results after the last step are presented. SMAS-30; Self-Management Ability Scale; SPF-IL, Social Production Function Index Level Scale. * $p \leq 0.01$; ** $p \leq 0.001$.

well-being and the mediating effect of overall self-management ability on well-being. First the short-term effects (at T₁) were analyzed. SPF-IL scores at T₀ were entered into the equation in the first step, and accounted for a significant 43% of the variance in SPF-IL scores at T₁ (F change (1, 103) = 78.23, $p < 0.001$). Higher scores on the SPF-IL at T₀ resulted in higher scores on the SPF-IL at T₁ ($\beta = 0.66$, $p < 0.001$). Condition (intervention or control), entered into the equation in the second step, contributed significantly to the model (F change (1, 102) = 7.90, $p \leq 0.01$), and yielded an increase of 4% in explained variance. This indicates that the women who completed the intervention scored higher on the SPF-IL at T₁ than the controls ($\beta = 0.20$, $p < 0.01$). Next, to test the mediating effect of self-management ability on well-being, SMAS-30 scores at T₁ were entered into the equation. This resulted in a significant increase in explained variance (F change [1, 101] = 17.60, $p < 0.001$). As shown in Table III, there was a significant main effect of SMAS-30 scores at T₁ on well-being at T₁ ($\beta = 0.30$, $p < 0.001$). Self-management ability acts as a mediator to the extent that it accounts for the relationship between condition (intervention or control) and well-being (Baron & Kenny, 1986). Therefore, three conditions have to be met. Firstly, condition has to account significantly for the variation in self-management ability, and the results of the ANCOVA showed that this condition was met. Secondly, variations in self-management ability must account significantly for variations in well-being. This was also found to be true in the hierarchical regression analyses. Finally, the relationship between condition and well-being has to be reduced by self-management abilities. As shown in Table III, this final condition has not been met: the contribution of condition remained significant, and the β changed from 0.20 in step 2 to 0.19 in step 3, indicating that there was a very small, but non-significant reduction in the contribution of condition to well-being after adding self-management abilities to the equation. It can therefore be concluded that, although there was an effect of the intervention on well-being, this effect

was not mediated by increased self-management ability at T₁.

To test whether the effect of the intervention on well-being was still present after six months (at T₂) an identical hierarchical regression analysis was performed, but with well-being at T₂ as the dependent variable. Condition, entered into the equation in the second step, did not improve the model (F change [1, 80] = 0.02, $p = 0.90$). Although the well-being of the women who had completed the intervention improved at T₁, and remained at this higher level at T₂ (see Table II), they did not have higher scores for well-being at T₂ than the controls ($\beta = 0.01$, $p = 0.90$). Unexpectedly, the well-being of the controls also improved at T₂. It must therefore be concluded that the effect of the intervention on well-being was no longer significant after six months.

The effect of the intervention: Loneliness

Due to non-normality of the data, Wilcoxon signed rank tests were performed on the loneliness scores. The loneliness scores of the women who completed the intervention were significantly lower at T₁ (Mdn = 9) than at T₀ (Mdn = 9), $T = 89.0$, $p < 0.01$, $r = -0.31$. However, the women in the control group also had significantly lower scores for loneliness at T₁ (Mdn = 8), compared to T₀ (Mdn = 8), $T = 404.5$, $p < 0.05$, $r = -0.20$. This indicates that, although loneliness was reduced in the intervention group, this is a non-significant change, because it was also reduced in the control group.

When considering emotional and social loneliness separately, differential results were found (see Table II). The women in the intervention group had significantly lower scores for emotional loneliness at T₁ (Mdn = 5) than at T₀ (Mdn = 6), $T = 24.0$, $p < 0.01$, $r = -0.32$, but the controls also had marginally significant lower scores for emotional loneliness at T₁ (Mdn = 5) than at T₀ (Mdn = 5), $T = 203.5$, $p = 0.06$, $r = -0.18$. However, the intervention appeared to be effective for social loneliness. The women in the intervention group had significantly lower scores for social loneliness at T₁ (Mdn = 4) than at T₀ (Mdn = 4), $T = 79.5$,

$p < 0.05$, $r = -0.19$, whereas the scores of the controls for social loneliness were not significantly lower at T_1 (Mdn=3) than at T_0 (Mdn=4), $T = 234.0$, $p = 0.17$.

With regard to the longer-term effects (at T_2), the results showed that, although the scores in the intervention group were significantly lower at T_2 (Mdn=6) than at T_0 (Mdn=9), $T = -3.38$, $p < 0.01$, $r = -0.56$, the scores in the control group were also significantly lower for overall loneliness at T_0 (Mdn=9) than at T_2 (Mdn=7), $T = -3.13$, $p < 0.01$, $r = -0.40$. This again renders the difference between the two groups non-significant. The same applies to emotional loneliness and social loneliness. The scores for emotional loneliness of the women in the intervention were significantly lower at T_2 (Mdn=3.5) than at T_0 (Mdn=5), $T = -3.63$, $p < 0.001$, $r = -0.61$, but the controls also scored significant lower at T_2 (Mdn=4) than at T_0 (Mdn=5), $T = -2.93$, $p < 0.01$, $r = -0.37$. The scores for social loneliness of the women in the intervention group were not significantly lower at T_2 (Mdn=3) than at T_0 (Mdn=4), $T = -1.67$, $p = 0.10$, and the scores of the women in the control group were also not significantly lower at T_2 (Mdn=3) than at T_0 (Mdn=4), $T = -1.38$, $p = 0.17$.

It can be concluded that, although the scores of the intervention group on overall as well as on emotional loneliness improved immediately after the intervention (at T_1) and even more so after six months (at T_2), the scores on these outcomes of the women in the control group were also improved, rendering the effect of the intervention on overall and emotional loneliness non-significant. With regard to social loneliness, however, the intervention proved to be effective at T_1 . Scores for social loneliness were significantly lower in the intervention group than in the control group at T_1 , but this difference was no longer significant at T_2 , indicating that the intervention was no longer effective after six months.

Discussion

The main aim of the present study was to investigate whether single women, 55 years of age and older, improved on self-management ability, well-being, and social and emotional loneliness after having participated in a newly designed self-management group intervention that was based on the Self-Management of Well-being (SMW) theory. As expected, after completing the intervention, overall self-management ability and well-being improved in the intervention group, but not in the control group. These findings are in line with the results of two other intervention studies based on the same theory (Frieswijk et al., 2006; Schuurmans, 2004). However, it was found that the separate

self-management abilities were not influenced equally by the intervention. Three of the six self-management abilities improved significantly after the intervention: 'taking initiatives', 'positive frame of mind', and 'multifunctionality'. The other three ('self-efficacy', 'investment behaviour, and 'variety') showed a positive trend, but did not significantly improve, compared to the control group. This is a remarkable finding because in two other self-management intervention studies based on the same theory (Frieswijk et al., 2006; Schuurmans, 2004) the two abilities 'positive frame of mind' and 'multifunctionality' were not affected by the intervention, whereas all the others were. These inconsistent findings are difficult to interpret, and should be investigated further in future research.

A second aim of the study was to investigate whether improvements in well-being in the intervention group could be attributed to increases in self-management ability. However, this hypothesized mediation effect was not found. This again is unexpected, because the two other aforementioned SMW theory-based intervention studies did find evidence of these mediating effects (Frieswijk et al., 2006; Schuurmans, 2004). Possibly the relatively small sample size in the present study prevented any evidence of this effect. This should be taken into account in future research.

Another aim of the study was to investigate the effect of the intervention on overall loneliness, and on emotional and social loneliness. The results showed that, although the women in the intervention group were significantly less lonely after the intervention, these effects can not be attributed to the intervention, because the controls also reported that they were less lonely. It is possible that the extremely high scores for loneliness in both groups at baseline (*cf.* Van Tilburg & De Jong Gierveld, 1999) caused a regression to the mean, resulting in improvements in both groups. Comparable findings have been reported in other studies focusing on loneliness interventions (e.g., Stevens & Van Tilburg, 2000). The fact that the intervention group improved on social loneliness but not on emotional loneliness (immediately after the intervention), may indicate that social loneliness is easier to alleviate than emotional loneliness. Emotional loneliness relates, in particular, to the lack of an attachment figure, which may be difficult for single older women to resolve. Social loneliness, on the other hand, relates to a lack of meaningful relationships and social integration, which may be relatively easier to amend. The present intervention focused on both forms of loneliness, but due to the relatively short duration of the intervention it may have been easier for the participants to improve on social loneliness.

Although the present intervention consisted of only six weekly sessions, and may therefore have been too short to achieve permanent changes in behaviour and habits, we still wished to investigate

the extent to which such a short intervention could lead to improvements in the longer-term. Overall, the results were interesting in this respect. On all main outcomes (i.e., overall self-management ability and well-being) the improvements found in the intervention group immediately after the intervention had been maintained after six months, but these improvements were no longer significant because the women in the control group had also improved on these variables after six months. In other words, although the intervention group improved on all main outcomes, the longer-term effectiveness of the intervention could not be proven, because the control group also improved. This is a remarkable finding, which often seems to occur in experimental studies, and for which several explanations are possible (see Becker, Roberts, & Voelmeck, 2003), one of which is the Hawthorne effect. This refers to the phenomenon that controls, although they do not receive the intervention, behave differently simply because they know that they are participating in a study. Another explanation could be reactivity of measurement, which refers to changes in participants' answers to questions just because they are being measured. For example, answering questions about taking the initiative toward friends, may also encourage controls to think about—and eventually act upon—such behaviour, and thus to change their behaviour. With such findings it seems important, as recommended by Becker et al. (2003), to redesign future research projects taking all these possible explanations into account, rather than to abandon a potentially useful intervention.

The present study may have some further limitations. One point of concern is the unequal rate of drop-out in both groups. There were more drop-outs in the intervention group than in the control group. This could possibly be a result of the rather unrestricted inclusion criteria, which implied that women with serious problems, such as psychopathology, recent loss, or bereavement, could be included in the intervention. These women may have found it difficult to function in a group. Moreover, the finding that the drop-outs tended to have less self-management abilities than those who completed the intervention, may indicate that a group intervention is only suitable for women who have a reasonable level of self-management ability. An individual self-management intervention might have been more appropriate for the drop-outs. In future studies more specific inclusion criteria are recommended, to achieve an optimal fit between target group and type of intervention.

Another limitation, related to the above, concerns the way in which the women were recruited. They were recruited on the basis of self-selection, and appeared to be extremely lonely compared to the loneliness rates reported in other studies among community dwelling older people (Kremers, Steverink, Albersnagel, & Slaets, in press;

Tijhuis, De Jong-Gierveld, Feskens, & Kromhout, 1999; Van Tilburg & De Jong-Gierveld, 1999; Von Faber et al., 2001). Consequently, selection bias may have occurred. Also the finding that part of the women reported that the intervention did not quite meet their expectations, could have affected the results. Future studies should reconsider the methods used to recruit participants for such interventions, to ensure that the target group is, indeed, included.

As an overall conclusion, it can be stated that, although there was no statistical evidence of longer-term effectiveness, the short-term findings support the effectiveness of this SMW theory-based intervention in improving self-management ability and well-being in single older women.

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